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REMARKS

Pending Claims:

Claims 1, 6-11; and 15-28 are currently pending in the present application. Claims 1, 6, 10, 15, 16 and 21 are amended by the present Amendment. Claim 2-5, and 12-14 are herein cancelled. New claims 22-28 are added.

Objection to the Claims:

Claim 5 is objected to because of a typographical error. Claim 5 has been cancelled.

Rejections under 35 U.S.C. §102(b) as Being Anticipated by JP2000047117:

To anticipate a claim under 35 U.S.C. §102, a single reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught by the reference must be inherently present in the reference. Thus, a claim is anticipated by a reference only if each and every element of the claim is described, either expressly or inherently, in a single prior art reference.

Claims 1-3, and 7 are rejected under 35 U.S.C. §102(e) as being anticipated by JP2000047117, Ulrich et al. (hereinafter "the JP reference"). The published German patent application corresponding to the JP reference was translated by the Applicant's German translator and was submitted to the U.S. Patent Office in a Supplemental Information Disclosure Statement on August 30, 2004.

The Office Action states that the JP reference discloses a device and method of tuning/maintaining a laser scanning-type microscope equipped with an AOTF and a temperature sensor fitted directly to the AOFT. The Office Action concludes the JP reference implies that frequency applied to the AOTF is varied in response to a control signal in order to maintain proper phase-matching criteria.

Independent claim 1 is herein amended to more clearly recite the invention. Amended independent claim 1 recites a step of measuring a delay time of a surface acoustic wave propagating between a first and a second SAW transducer on the acousto-optic device. The step

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of measuring the delay time recited in amendment claim 1 is not taught or suggested by the JP reference. The JP reference does not describe the use of a SAW transducers. The Applicants believe that the JP reference describes the use of a conventional temperature detector that measures the ambient temperature of a bulk AOTF device. In fact, the methods and apparatus of the present invention do not require an actual temperature measurement. The measurement of the delay time of the surface acoustic wave can be used to determine the speed of sound at the surface of the acousto-optic device. The frequency of the signal applied to the acoustic wave transducer can then be determined from the speed of sound.

Therefore, the Applicants submit that the JP reference does not describe every element of claim 1 as currently amended. Thus, the Applicants submit that amended independent claim 1 is not anticipated by the JP reference under 35 U.S.C. §102 and is therefore allowable. In addition, the Applicants submit that dependent claim 7 is allowable as depending from an allowable base claim.

Rejections under 35 U.S.C. §103:

To be unpatentable under 35 U.S.C. §103(a), the differences between the subject matter sought to be patented and the prior art must be such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art. There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the reference teachings. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.

Independent Claims 10 and 21 and Dependent Claims 11-13, 16, and 18

Claims 10-13, 16, 18 and 21 are rejected under 35 U.S.C. §103(a) as being unpatentable over the JP reference in view of U.S. Patent No. 5,039,855 to Kemeny (hereinafter "Kemeny"). The Office Action states that the JP reference implies that the frequency applied to the AOTF is varied in response to a control signal in order to maintain proper phase-matching criteria, but does not explicitly state that the device comprises a processor and an oscillator. The Office Action further states that Kemeny discloses an acousto-optic system that includes a

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controller/microprocessor that generates a signal for a circuit that includes an oscillator. The Office Action concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device disclosed in the JP reference to include a processing circuit and a VCO as taught by Kemeny in order to obtain a fine control and speed of controlling an AOTF.

Independent claims 10 and 21 have been amended to more clearly define the invention. Amended independent claim 10 recites a first and a second SAW transducer that are positioned on the acousto-optic substrate. The first SAW transducer generates an acoustic wave and the second SAW transducer receives the acoustic wave generated by the first SAW transducer and generates a voltage signal that is proportional to a strength of the received acoustic wave. Amended independent claim 21 recites a means for measuring a delay time of a surface acoustic wave propagating between a first SAW transducer and a second SAW transducer on the acousto-optic device.

Applicants submit that the JP reference and Kemeny together do not suggest or motivate the first and the second SAW transducer recited in independent claim 10 as currently amended and the means for measuring the delay time as recited in independent claim 21. In view of the above remarks, Applicants submit that amended independent claims 10 and 21 are not obvious under 35 U.S.C. §103(a) over the JP reference in view of Kemeny and, therefore, are allowable. Applicants also submit that dependent claims 11, 16, and 18 are allowable as depending from an allowable base claim. Claims 12 and 13 are cancelled by the present amendment.

Dependent Claims 4 and 5

Claims 4-5 are rejected under 35 U.S.C. §103(a) as being unpatentable over the JP reference in view of U.S. Patent No. 4,936,308 to Fukukita et al. (hereinafter "Fukukita"). The Office Action states that the JP reference discloses the method of these claims, but does not explicitly teach measuring a delay time and indirectly measuring temperature. The Office Action further states that Fukukita describes a device that performs indirect temperature measuring by transmitting pump pulses and probe pulses onto an object of interest and obtaining the variations in delay time between the pump and the probe. The Office Action concludes that

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it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed in the JP reference so as to obtain temperature indirectly using a probe and a pump.

Claims 4 and 5 are herein cancelled. However, some of the limitations in these claims are now recited in amended independent claims 1, 10, and 21 and new independent claim 28. For example, independent claim 1 as currently amended recites a step of measuring a delay time as described herein. Independent claim 10 has been amended to recite a first and a second SAW transducer as described herein. Independent claim 21 has been amended to recite a means for measuring a delay time as described herein. New claim 28 recites a SAW oscillator having a first transducer and a second transducer that are positioned in the acousto-optic substrate. The SAW oscillator generates a SAW oscillator signal at an output having a frequency that is related to a temperature of the acousto-optic substrate. Applicants submit that the JP reference and Fukukita together do not suggest or motivate these claim limitations.

Fukukita describes a method of acoustic characteristic measurement that includes transmitting an ultrasonic probe pulse and a pump pulse signal into a specimen and receiving reflections of the transmitted pulse from two or more reflecting points. The received reflection signals are then frequency analyzed to obtain a spectral ratio. A distribution of a cross over frequency and a degree of spectral separation are then calculated from the spectral ratio.

The method described in Fukukita is a pulsed technique that is used to indirectly measure temperature. The methods and apparatus recited in amended independent claims 1, 10, and 21 and new claim 28 are fundamentally different from the pulsed technique and apparatus described in Fukukita. For example, the surface acoustic wave propagating between the first transducer and the second transducer in the method claimed in amended claim 1 is a continuous sine wave propagating on the surface of the device and not a pulse propagating through the bulk substrate as described in Fukukita.

The Applicants believe that the methods and apparatus recited in amended independent claims 1, 10, and 21 and new claim 28 are simpler because the methods and apparatus do not perform complicated frequency analysis to calculate spectral ratios as described in Fukukita. In

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addition, the Applicants believe that these methods and apparatus are more accurate because a better signal-to-noise ratio can be achieved by using a sine wave instead of a pulse. In addition, the Applicants believe that the methods and apparatus recited in the amended independent claims are more accurate because these methods use the same type of transducers on the same surface as the acousto-optic device itself. Therefore, the response of the transducers and the response of the acousto-optic device will be substantially identical. Furthermore, the Applicants believe that the methods and apparatus of the present invention are more accurate because measurements are made on the surface of the device where the acousto-optic device is located rather than in a bulk substrate that is subject to temperature gradients. For example, measurements of a bulk substrate, such as the measurements described in Fukukita, would not accurately reflect localized heating effects.

In view of the above remarks, Applicants submit that amended independent claims 1, 10, and 21 and new claim 28 are not obvious under 35 U.S.C. §103(a) over the JP reference in view of Fukukita and, therefore, are allowable. Applicants also submit that dependent claims 6-9, 11, 15-20 and 22-27 are allowable as depending from an allowable base claim.

Dependent Claims 6, 8 and 9

Dependent claim 6 is rejected under 35 U.S.C. §103(a) as being unpatentable over the JP reference in view of U.S. Patent No. 6,164,816 to Aderhold et al. (hereinafter "Aderhold"). Dependent claim 8 is rejected under 35 U.S.C. §103(a) as being unpatentable over the JP reference in view of U.S. Patent No. 5,513,913 to Ball et al. (hereinafter "Ball"). Dependent claim 9 is rejected under 35 U.S.C. §103(a) as being unpatentable over the JP reference in view of U.S. Patent No. 5,349,859 to Kleppe et al. (hereinafter "Kleppe").

As stated above, independent claim 1 has been amended to recites a step of measuring a delay time of a surface acoustic wave propagating between a first and a second SAW transducer on the acousto-optic device. There is no suggestion or motivation in any of the references (the JP reference, Aderhold, Ball and Kleppe) to measure the time delay as recited in amended independent claim 1. Thus, Applicants submit that amended independent claim 1 is not obvious under 35 U.S.C. §103(a) over the JP reference in view of Aderhold, Ball and Kleppe and,

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therefore, is allowable. Applicants also submit that dependent claims 6, 8, and 9 are allowable as depending from an allowable base claim.

Dependent claim 14 is rejected under 35 U.S.C. §103(a) as being unpatentable over the JP reference in view of Kemeny and U.S. Patent No. 6,545,550 to Frerking (hereinafter "Frerking"). Dependent claim 15 is rejected under 35 U.S.C. §103(a) as being unpatentable over the JP reference in view of Kemeny and Aderhold. Dependent claim 17 is rejected under 35 U.S.C. §103(a) as being unpatentable over the JP reference in view of Kemeny and U.S. Patent No. 5,473,640 to Bortolini (hereinafter "Bortolini"). Dependent claim 19 is rejected under 35 U.S.C. §103(a) as being unpatentable over the JP reference in view of Kemeny and Ball. Dependent claim 20 is rejected under 35 U.S.C. §103(a) as being unpatentable over the JP reference in view of Kemeny and Kleppe.

As stated above, independent claim 10 has been amended to recite a first and a second SAW transducer that are positioned on the acousto-optic substrate. The first SAW transducer generates an acoustic wave and the second SAW transducer receives the acoustic wave generated by the first SAW transducer and generates a voltage signal that is proportional to a strength of the received acoustic wave. There is no suggestion or motivation in any of the references (the JP reference, Aderhold, Kemeny, Ball, Bortolini, Frerking, and Kleppe) of the first and a second SAW transducer recited in independent claim 10. Thus, Applicants submit that amended independent claim 10 is not obvious under 35 U.S.C. §103(a) over the JP reference in view of Aderhold, Kemeny, Ball, Bortolini, Frerking, and Kleppe and, therefore, is allowable. Applicants also submit that dependent claims 14, 15, 17, 19 and 20 are allowable as depending from an allowable base claim.

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CONCLUSION

Claims 1, 6-11, and 15-28 are currently pending in the present application. Claims 1, 6, 10, 15, 16 and 21 are amended and claims 2-5, and 12-14 are cancelled by the present Amendment. New claims 22-28 are added. In view of the foregoing amendments and remarks allowance of all pending claims (i.e., claims 1, 6-11, and 15-28) is respectfully requested.

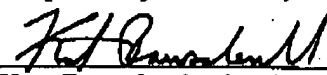
The Commissioner is hereby authorized to charge the extension and additional claims fee and any other proper fees to Attorney's Deposit Account No. 501211.

If, in the Examiner's opinion, a telephonic interview would expedite prosecution of the present application, the undersigned attorney would welcome the opportunity to discuss any outstanding issues, and to work with the Examiner toward placing the application in condition for allowance.

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Respectfully submitted,


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